

# Montana Specialty Crop Block Grant

## *Projects Funded 2015*

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### Montana State University

#### *Determining the Role of Pathogens on Honey Bee Colony Health*

**\$52,799.00**

The long-term goal of the research proposed herein is to improve the health of Montana's honey bee population by better understanding the role of pathogens, colony strength, and additional factors in the almond pollination system. Honey bees have a dual role in agriculture; they are producers of honey and essential pollinators of numerous specialty crops (i.e., cherries, almonds, apples, blueberries and legume seed). In 2013, Montana commercial beekeepers ranked 2nd in honey production producing 15 million pounds valued over \$30 million. Project Rationale/Need: Beekeepers generate a large part of their revenue through pollination services and the majority of Montana's commercial beekeepers transport their colonies to California each fall to pollinate the almond groves. In almonds, colony rental fees depend on colony health ("frame counts"). Almond pollination season is also when the majority of colony deaths occur; annual colony losses have averaged 32% since 2006. Honey bee colony losses attributed to Colony Collapse Disorder (CCD) are associated with pathogens, but the role of specific pathogen(s) in colony losses remains unknown. We hypothesize that pathogens play a primary role in colony losses. Goal/Outcomes: To investigate the role of pathogens on colony losses we will obtain honey bee samples from 45 colonies before, during, and after almond pollination season. We will perform molecular diagnostics for 14 bee-associated pathogens, and quantitatively assess this data. Project success will be measured by successful research collaborations, the number of samples assessed/analyzed and statistical assessment of the correlation between pathogen incidence/abundance and colony health.

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### Western Montana Growers Cooperative

#### *Improving the Competitiveness of Specialty Crop Producers through Packaging, Marketing, and Food Safety*

**\$47,890.00**

Packaging can be a barrier for smaller fruit and vegetable growers to access larger wholesale markets. Each package must meet food safety, operational, and marketing needs of the retailer. The Western Montana Growers Cooperative (WMGC) will improve access for Montana fruit and vegetable producers to supermarkets through a pilot project using branded packaging for a range of locally grown specialty crop products that span numerous farms. Packaging and item identification will be themed to promote

awareness of locally grown specialty crops among consumers and coded with Universal Product Code (UPCs) and Price Look Up Codes (PLUs) to facilitate store operations. In addition, WMGC will pilot the distribution of produce in cleaned and sanitized Reusable Plastic Containers (RPCs) that are food safety compliant and resource efficient. We will monitor sales increases through supermarkets and tabulate volumes and costs for the RPCs used. This project will pilot two important packaging strategies that will help position Montana fruit and vegetable growers and growers nationwide to better compete in the large grocery market.

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## **Organic Seed Alliance**

### *Increasing Access to Regionally Adapted Organic Seed for Montana's Specialty Crop Growers*

**\$62,409.00**

There is high demand for locally produced organic vegetables in Montana, but producers are increasingly in need of seed that is adapted to our state's climate and environmental conditions. Stakeholders have identified three key crops as prime opportunities for expanding access to regionally adapted and organically produced seed: beets, carrots, and storage onions. This project will expand access to seed for these crops by (1) providing trainings to organic specialty crop seed producers and producer groups in post-harvest handling and in establishing quality assurance procedures; (2) enabling organic specialty crop growers to solve production challenges through access to organically produced and regionally adapted varieties, and (3) expanding organic production practices in specialty crop seed production. This project builds off of a previously funded Montana specialty crop block grant that supported our partner, Lake County Community Development Corporation, and their work to create the Triple Divide Organic Seeds Cooperative. Beyond the direct benefits that the addition of seed production can bring to farm enterprises, local seed and local variety development are important pieces of developing sustainable food systems at a regional level. Varieties that are locally adapted will give producers tools to address local climates, deal with pest and disease problems, extend their seasons, and expand into new markets. We will measure the success of this project through evaluations of producers and by the number of new regionally adapted organic seed varieties that enter, or are close to entering, the commercial marketplace.

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## **Montana State University**

### *Development of Pheromone Based Monitoring and Mass Trapping for Pea Leaf Weevil in Pulse Crops*

**\$91,787.00**

The pea leaf weevil, *Sitona lineatus* is emerging as a serious pest of pulse crops in Montana. Lentils, peas and beans have increased in acreage in the last 7 years in this area. In the past two years, pea leaf weevil numbers have increased significantly. At the moment, monitoring programs are based on damage to

leaves of growing plants, despite a large body of evidence showing most damage is caused by larvae of weevils and that leaf damage is independent of yield loss. Larval damage to N-fixing nodules can reduce yields by as much as 30% and further damage legume benefits as a crop rotation by reducing N-fixation in the soil. This project aims to develop known pheromone attractants into monitoring systems for pea leaf weevil. A pheromone lure discovered in 1988 in England by Blight et al. (1984) and used for pea leaf weevil monitoring in 1999 by Quinn et al (1999) in Washington state shows promise for a development of an early warning system and mating disruptor. This pheromone has not been developed for extensive monitoring and trapping programs in peas despite its potential and the relative ease of optimization required. Testing of different trap types, trapping distance, timing, and lure concentration are the next steps toward development of this system into a quantifiable easy to use tool for farmers. Current management strategies rely on accurate monitoring of pest populations. Pheromone baited traps will help in monitoring and mass trapping the weevil population.

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## **Montana State University**

### *Food Safety Training for Montana Specialty Crop Growers, Producers, Processors, and Manufacturers*

**\$260,135.21**

Montana Manufacturing Extension Center (MMEC) will provide food safety training to specialty crop growers, value added agriculture producers, and manufacturers. MMEC will work in coordination with the Montana Department of Agriculture to provide training to extension agents so that they may provide training in their regions. Food safety training may include such topics as HACCP, Global Food Safety Initiative (GFSI), Good Manufacturing Practices (GMPs), Good Agricultural Practices and Good Handling Practices (GAP & GHP), and more. Food handling, processing, and manufacturing regulations are increasing and applicable across the entire value chain from grower, to manufacture, to shipping. The goals of this effort will be to work in coordination with the Montana Food & Agriculture Development (FADC) Network to provide training across the state to value added producers and to establish the ability for county extension agents to provide this training. MMEC will supplement and not overlap existing SCBG efforts of the FADC Network. Partnering with the FADC combines MMEC's training and project delivery capabilities with abilities of the FADC to know the specific training needs in the local region and their logistical capabilities to identify training needs and promote, coordinate, host, and survey training activities. This combined team will be an asset for Montana to address the food safety training and compliance need. The success of this program as applied to training recipients will be measured by the following metrics: increased sales, retained sales, jobs created, jobs retained, and cost savings. This data will be gathered using the NIST-MEP and FADC survey processes.

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## **Great Falls Development Authority**

### *Montana Based Pulse Crop Fractionation Industry Opportunity*

**\$36,000.00**

The Great Falls Development Authority (GFDA) will promote new opportunities for businesses to engage in Pulse Crop Fractionation operations in the Great Falls trade area. GFDA will utilize business cases targeted toward companies that currently are or plan to supply pulse crops ingredients, derived from peas, lentils, and chickpeas, to food and feed marketplaces. GFDA will engage businesses and investment groups in the Great Falls trade area with business case information and will also engage businesses outside the area with direct visits and trade show attendance. The use of business cases by GFDA will provide concise industry-specific information to educate and influence senior management and owners on the employment of time, money, and resources to benefit from an investment opportunity in developing and operating a Pulse Crop Fractionation operation in Montana.

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## **Montana Department of Agriculture**

### *Promoting Pulse crops for 2016 International Year of Pulses*

**\$15,799.85**

Pulse crops play a significant role in enhancing global food and nutrition security, environmental protection and enhancing the livelihoods of smallholder farmers. They have been defined as a super food, providing an affordable source of protein, are high in fiber, contain no gluten and may help with blood glucose management. In addition to the health benefits, pulses return nitrogen into soils and, when rotated with other crops, will reduce farmers' need for chemical fertilizer, saving farmers money and reducing greenhouse gases (GHGs).

However, there is a lack of consumer awareness of where pulse crops come from, what their benefits are and, for those who are aware of pulses, how to integrate them into their diet. With the United Nations proclaiming 2016 International Year of Pulses, this is the single largest opportunity to increase awareness of pulses. This project will develop and air a television and radio spots targeted to raise consumer awareness of Montana grown pulse crops. The advertisements will make consumers aware of Montana grown peas, lentils and chickpeas, and direct them to resources to find more information on their health benefits and how to purchase and prepare pulses.

The objective of this project is to increase the sales of Montana grown pulse crops through a public awareness campaign targeted to consumers.

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## **Montana State University**

### *Developing Integrated Weed Management Strategies for Organic Chickpea Production*

**\$94,167.00**

Chickpea (*Cicer arietinum*) is a high-value pulse crop with excellent market potential and rotational benefits for growers in Montana. Demand for chickpea has been growing rapidly, creating opportunities for growers. Based on current yields and prices, crop values are \$400-700 per acre for conventionally-grown and \$700-800 per acre for organic chickpeas. To realize these benefits, producers need varieties and integrated pest management practices that fit their climates and production systems. Weed and disease management are the primary challenges in both conventional and organic production. Research on other pulse crops has shown that improving crop vigor by breeding or increasing seeding rates can improve crop competition with weeds without increasing disease. However, these methods have not been tested in chickpea. This proposed project aims to improve chickpea production in Montana by screening chickpea varieties with vigorous seedling establishment and high nitrogen fixation capacity, which will enhance the crop to compete with weeds, reduce disease infestation, and increase rotational benefits. In this project, we also investigate weed management strategies that integrate agronomic practices, such as increased seeding rate and mechanical weed control after planting. The research will be carried out at the Western Agricultural Research Center and Eastern Agricultural Research Center of Montana State University. To improve producer awareness and practices, results will be communicated with growers via field days and print and web-based publications. Research goals will be evaluated through meeting benchmarks (e.g. completing trials and publication of results). Changes in producer awareness and practices will be monitored with surveys.

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## **Montana State University**

### *Integrated Pest Management of Insect Pests in Fruit Trees*

**\$52,499.00**

This project will monitor for insect pests of concern and potential invasive insects for tree fruits in Montana. Monitoring for key pests will be conducted in commercial apple and cherry orchards in western Montana. Associated with these monitoring activities will be outreach and educational activities including a MontGuide “Montana Fruit Tree Insect Pests.” This guide will be a resource for commercial growers, hobbyists, extension agents, and consultants in Montana tree fruits. It will include a list of current pests, potential invasive pests, and natural enemies relating to tree fruits. Outreach will also be conducted through press releases, radio and/or television appearances, and presentations that are part of the routine duties of the PI. An assessment of current and potential economically important orchard insect pests is critical to implementing accurate pest management decisions.

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## **Montana State University**

### *Survey of Montana State for Pathogens of Economic Importance in Field Peas*

**\$122,630.84**

Pulses in United States refer to chickpeas (*Cicer arietinum*), field peas (*Pisum sativum*), and lentils (*Lens culinaris*) cultivated and consumed as food and feed. Most U.S.-grown pulses are exported, and Montana leads the U.S. in pulse crop production. A major constraint to pulse crop production are

diseases which can reduce yield, lower seed quality, and limit seed exports due to phytosanitary restrictions by importing countries. Increasing acreage of pulse crops, short (2y) rotations, and reduced tillage practices favor disease development. Also, the use of fungicides, climatic conditions, area-specific disease vectors, and movement of seeds across state and national boundaries result in variation in disease potential. Control and management of pulse diseases involves identification of the pathogens and characterization of the variability within the pathogen populations. Montana State pulse fields have not been surveyed for diseases and their causal agents. We propose gathering baseline data on Montana disease issues of pulse crops with a focus on peas for three years. Develop diagnostic tools for the detection of pathogens of economic interest, and management information on these pathogens will be provided to farmers through our extension efforts. Breeders will have available the information, techniques, and pathogen isolates needed for screening for varietal resistance to economically important pathogens identified in Montana. The overall impact of this project will be mitigation of seed yield loss and seed poor quality associated with limited knowledge of field pea pathogens in Montana. We request for the first year funding of the project.

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## **Lake County Community Development Corporation**

### ***Farm to Institution: Building the Capacity of Mission Mountain Food Enterprise Center through Product Development***

**\$123,004.00**

The Farm to Institution project seeks to increase the competitiveness of Montana Specialty Crops by researching and developing value-added products that will address seasonal availability barriers for institutional markets. Mission Mountain Food Enterprise Center (MMFEC) will develop recipes with institutional, dietetic, food science, and specialty crop producer input to create healthy, local, year round products. Recipes will be tailored to use specialty storage crops such as carrots, beets, squash, apples, potatoes, and onions, among other non-storage crops. Established relationships with K-12 schools, universities, hospitals and other statewide partners will be tapped to develop institutional products that meet their needs, tastes, and price points. This project will increase economic opportunity for specialty crop growers throughout the state as extensive outreach will be made to assure that a diverse group of growers participates and quantities can be met for institutional demand to enhance specialty crop competition within the market. Evaluation on products developed will be conducted through a state-wide network of established institutions such as National Center for Appropriate Technology's FoodCorps and their 10+ K-12 site locations and the University of Montana's culinary program. The results of the project will be highlighted through promotional posters and a quarterly report which will be shared with all stakeholders.

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## **USA Dry Pea & Lentil Council**

### *Commissioning a National Competition in Creative Uses Utilizing USA Grown Pulses*

**\$126,735.00**

Develop and execute the Pulse Product Development competition for the United States and an online pulse focused toolkit for college and university food science programs to introduce, inform and inspire next generation food professionals in using pulse ingredients in consumer packaged goods in lure of the United Nations announcing 2016 the International Year of Pulses (IYOP). In addition, provide classroom resources to educate students about the benefits of eating and using pulse ingredients; develop tools to show resolutions for common obstacles and ingredient swaps; collect student food applications to share on the USADPLC website to share with industry; collect marketing strategies for new applications; and survey participants on new findings, best practices, new markets and obstacles they encountered using pulse ingredients; host a semifinal event at the 2016 Research Chef's Association (RCA) and educational session at the Institute of Food Technologists (IFT) annual meeting to train food professionals and announce the global winner and showcase new products and our member's products.

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## **Montana State University**

### *Growing Markets for Montana Produce: Improving Efficiency, Access, and Food Safety in the Bitterroot Valley*

**\$91,717.00**

The 100 mile-long Bitterroot Valley in southwest Montana was historically the center of fruit and vegetable production in the state. After decades of declining specialty crop production, markets for local produce have started to grow again. There are six farmers markets and over 45 fruit and vegetable farms in the valley. However, the market growth has been slowed by lack of education, coordination, and distribution. This project will meet these needs by building networks among farmers, consumers, and buyers. It will educate consumers and wholesale produce buyers about the value of local food (i.e. marketing), as well as providing a unified platform for marketing, sales aggregation, and distribution of local specialty crops. The later will be accomplished by building a web-based marketing and sales platform and hiring a marketing/distribution coordinator. It will also strengthen local markets by improving on-farm food safety. Growers across southwest Montana will be educated about Good Agricultural Practice (GAP) standards and will develop food safety plans that can be shared with buyers/consumers. Marketing efforts will also include a quarterly newsletter, advertising in local media, and an annual Harvest Celebration dinner. This project will bring local food to hundreds of consumers and will support the growth of specialty crop production in the Bitterroot Valley. The success of this project will be measured by participation by institutions and farms in the sales/distribution system, the growth in local produce sales, and completion and implementation of farm food safety plans.

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## **Montana State University**

### *Economic Benefits from Certified Virus-Screened Potatoes*

**\$32,888.00**

Potato Virus Y (PVY, also known as Potato Mosaic Virus), the most important virus disease of potatoes worldwide, has large current and potential impacts on potato production throughout the United States. Montana has the premier seed potato program in the country and produces roughly 10 percent of all seed potatoes planted in the United States, not including a high volume of seed that originates in Montana but is recertified elsewhere.

Yield losses of up to 80% have been reported from PVY. The most effective method of avoiding losses from PVY is the planting of virus-free seed. The Montana Seed Potato Certification Program housed at Montana State University provides testing and certification for a variety of viruses including PVY.

Many commercial potato growers (those that sell potatoes for processing, chipping, and fresh) are unaware of the importance of PVY, and of planting certified seed. This work will provide an economic analysis of the benefits from doing so and the benefits from the Montana Seed Potato Certification Program to the states it serves, predominantly Idaho, Oregon, and Washington. Specific information that quantifies the benefits of using certified seed will allow growers to make better, more informed decisions about whether to plant certified seed.

Success will be measured in completion of grower interviews, subsequent analysis, and resulting publications, presentations, and the development of an online decision tool.

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## **Montana Department of Agriculture**

### *Specialty Crop Block Grant Management and Monitoring*

**\$91,769.00**

For the management and monitoring of projects over the three year grant period.